IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Applicant	:	RICHARD A. PROULX, ET AL.	
Filed	:	November 14, 2003	
Title	:	Method of Manufacturing Noise Attenuating Flexible Cutting Line for Use in Rotary Vegetation Trimmers	
TC/A.U.	:	1732	
Examiner	:	Mark Eashoo, Ph.D.	
Ref. No.	:	086333.00004	
Customer No.	:	34261	

Mail Stop Amendment
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DECLARATION OF RICHARD A. PROULX

Dear Sir:

I, RICHARD A. PROULX, do hereby declare as follows:

CERTIFICATION UNDER 37 C.F.R. §§ 1.8(a) and 1.10

I hereby certify that, on the date shown below, this paper (along with any referred to as being attached or enclosed) is being:

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Cheryl A. Boberg
Signature

Date: September 22, 2005

Cheryl A. Boberg
(type or print name of person certifying)

1. I am a resident of Rancho Cucamonga, California, and President of Proulx Manufacturing, Inc., a manufacturer of rotary-type vegetation trimmer heads and the flexible monofilament cutting line used in those trimmer heads. I am also a co-inventor of the noise attenuating cutting line and of the process for manufacturing such line which is the subject of the claims now pending in this application.

2. I have been actively involved in the development and manufacture of rotary-type vegetation trimmer heads and the cutting line used in those heads since 1982. I am the sole or co-inventor of record on the following United States Patents which are directed to such cutting line and methods of manufacture: 5,807,462; 5,814,176; 5,891,288; 6,124,034 and 6,910,277. I have also engaged in extensive testing of rotary type vegetation trimmer heads and numerous configurations of flexible cutting line used in those heads. As a result of this experience, I am thoroughly familiar with the cutting line used in rotary-type vegetation trimmers. I am also familiar with the trimmers, the trimmer heads and the interaction between the line and the heads, line and the vegetation and other objects it encounters in the field.

3. I have read U.S. Patent No. 4,186,239 (the Mize patent) and, based on that review, my experience in the rotary trimmer industry and my familiarity with such trimmers and the lines used therein, it would not, in my opinion, have been

obvious to one skilled in this art at the time of the filing of this application, to twist the cutting line illustrated in Figure 7 of the Mize patent in order to obtain noise attenuation or for any other reason.

4. The Mize patent discloses a filament with an irregular or variant cross-section to reduce the tendency of the filament to fibrillate. It does not deal with the problem of noise attenuation and there is nothing in the Mize patent that would cause me to study that patent or the line configurations it illustrates to develop a noise attenuating cutting line.

5. If I nevertheless did review the Mize patent in attempting to develop a noise attenuating line, there is also nothing in that patent that would suggest how such twisted configurations could be formed. More importantly, the Mize patent does not disclose or even suggest that a twisted line configuration could be formed in a single continuous process as in my invention. In addition, there is nothing in the Mize patent that would tell me that the twisted trough configurations disclosed in our present patent application or the twisted Mize configuration would be useful in attenuating the noise generated by the cutting line in rotary vegetation trimmers.

6. It is significant to note that the Mize patent does not teach any method for forming a length of twisted cutting line without a secondary step. The only twisted line shown in the Mize patent is in Figure 11. The patent does not describe

how that line is formed. However, from the regular spacing of the indentations along the top of each lobe, it is quite clear that it could not have been formed into a twisted configuration before the indentations were formed in the line. If a twisted line having four lobes were subjected to an indenting process, such as that illustrated in Figure 5 of the patent, the indentations would appear to be randomly formed on the line as the forming or cutting wheels are aligned at 90° with respect to each other and the lobes are twisted. I know of no automated process in which indentations such as those shown in the Mize patent could be uniformly placed at the ends of the four lobes as shown in Figure 11 if the line was twisted before it was indented. Certainly, Mize does not disclose such a process. He does, however, show in Figure 9 the same line in an untwisted state. Quite clearly, Mize suggests that the line of Figure 11 could be formed from a non-twisted four-lobe configuration as shown in Figure 9, indented, then heated and twisted to provide the configuration of Figure 11, albeit to prevent fibrillation, not noise reduction. Thus, Mize does not teach one skilled in the art how to extrude a twisted line formed of two adjacent or overlapping strands. In fact, he does not teach how to extrude a twisted strand of any configuration. The only twisted configuration is clearly a product of secondary processing.

7. It would not have been obvious to me upon reading the Mize patent that a cutting line shaped like that illustrated in Figure 7 could be twisted like that illustrated in Figure 11 to obtain noise attenuation. In fact, it is not obvious that

the line illustrated in Figure 7 could be twisted at all. Based on the illustration and written description of that line, there clearly is an insufficient material bond between the "dual circular elements" to enable the line to be heated and twisted without shearing apart and separating the two elements. If the two elements were to surprisingly remain together upon being heated and twisted so as to impart a permanent twist into the line, the resulting bond would fail immediately in the field when the rotating line encountered vegetation or other debris. The bond between the two adjacent circular elements would have to be substantially strengthened before such a line could be twisted. This is accomplished in our invention by providing an overlapping strand configuration which results from the twisting together of two molten strands. There is nothing in the Mize patent or anywhere else that I have seen to suggest the formation of the line by twisting together two or more molten strands. There is also no suggestion in the Mize patent to form a line of overlapping dual circular elements or of circular elements joined by a thick spanning web which might have the strength to withstand a secondary twisting step and hold the line together during use. Not only is no such configuration disclosed in the Mize patent, there is no apparent reason for one to want to make such a line configuration. To construct a cutting line having either an overlapping strand configuration or a thick structural connection between the circular portions would, in my opinion, not be obvious to one skilled in this art after having read the

Mize patent. As I stated above, I am skilled in this art and I would not have looked to Mize to develop a noise attenuating line. If I did, it would not have helped me.

8. I have also read and am familiar with U.S. Patent No. 6,434, 837 (the Fogle patent) that also was cited in the Office Action. That patent does not disclose any line configuration in which the cross-section defines V-shaped troughs. It discloses various lines having elliptical cross-sections as illustrated in Figures 3 and 5A-5C. In an attempt to verify that his elliptical illustration of the cross-section of his line was correct, I purchased cutting line purportedly covered by and marked with the Fogle patent number. I had the line independently analyzed to determine its cross-section and the analysis showed that the cross-section was indeed elliptical as described and illustrated in the patent. Thus, while Fogle teaches me that a twisted line will provide some noise attenuation, he does not teach me that a twisted line having a plurality of inwardly directed and generally V-shaped troughs terminating in fused seams that extend in a helical disposition about and along the length of the line would provide noise attenuation. Nor does he teach me how to form such line. Finally, he does not teach me how to form such a line using my continuous process.

9. In addition, I have read U.S. Patent No. 4,288,463 (the Groff patent). Based on my review, there is nothing in the Groff patent, which is directed to forming pretzel dough, that teaches extruding molten nylon copolymer material.

Because the materials are vastly different, and pretzels have little in common with nylon cutting line, it would not be obvious to look to the Groff patent in order to make a noise attenuating cutting line in the same manner.

10. Pretzel dough is very different from molten nylon and the two materials behave extremely differently upon extrusion. Dough is very viscous, so if it makes contact with a surface, it will tend to hold its shape. In contrast, molten nylon is fluid and will tend to flow. There is nothing in Groff that teaches or suggests that two molten nylon could be joined together and twisted to form a specific shape. Of course, Groff does not teach me why I would even want to form such a shape. Further, pretzel dough stays at a relatively constant temperature until it is baked after extrusion. Accordingly, extruding the highly viscous constant temperature through a pair of apertures in a slowly rotating die would be a simple and straightforward process. Molten nylon, however, is in a liquid state as it passes through the die apertures and has a specific set up point at which it begins to rapidly crystallize.

11. As the nylon polymer is extruded and twisted into its desired shape during our process, the material passes through multiple temperature zones, including a cooling quench bath and heating oven. During this process, the molten strands first crystallize on their outer surfaces as it is the outer surface that first cools. The interior of the strands are initially still in a liquid state when

crystallization begins. The strands then quickly crystallize inwardly from their outer surfaces as cooling continues. However, when the strands are first twisted together above the cooling quench bath, they are both in a molten or liquid state. There is nothing in Groff that suggests how to handle such a material or that such a material could be extruded through two adjacent openings and twisted together as claimed in our patent application. There is simply no similarity whatsoever in the handling and extrusion of the two materials to form a twisted configuration. I certainly would not look to a patent dealing with pretzel dough to teach me how to handle and extrude a molten nylon copolymer material into a desired configuration.

12. The difference between the process of forming a pretzel and a noise attenuating cutting line is accentuated by examining the end product. The twists in a pretzel are gentle and purely aesthetic, whereas the twists in the present invention are relatively tight for the functionality of attenuating noise. The cutting line resulting from the present invention preferably defines at least 15, and more preferably at least 20, twists per linear foot. This is achieved after a reheating and stretching step, during which the line is stretched approximately three times its original length. To create such a line configuration, then, the line has to contain 45-60 twists per linear foot upon extrusion. As the molten material is extruded through the die, the die is rotated about its central axis at speeds from 750 to 2500 rpm to effect the desired tight twist in the line. Groff is not concerned with extruding a molten material, a material that must be controllably cooled

immediately upon extrusion to prevent total fusion of the twisted strands and the loss of any recognizable shape, all while rotating the die at speeds far in excess of that needed to form a pretzel. In summary, the Groff patent would have been totally useless for my purposes. As one skilled in this art, I would not even have considered it. If it was shown to me, it would not have made obvious to me my process for forming our noise attenuating line which is the subject of this patent application.

I declare that all statements made of my own knowledge are true and all statements made on information and belief are believed to be true. I have been warned that willful and false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. 1001), and may jeopardize the validity of the application or any patent issuing thereon.

Signed at Rancho Cucamonga, California, this 21 day of September, 2005.

RICHARD A. PROULX

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